HPCOS81

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1. Introduction

"Information and Communication Technologies (ICTs) has the potential to improve the lives of people in rural communities"(*Ruxwana, Herselman, Conradie 2010*). In this research study, investigation is conducted in the promotion of basic health education programs using the ICT in the rural communities in South Africa. With a drastic change of ICT and the businesses surrounding it, there is a need to develop and put in place ways into which the provision of health care services can be achieved, this has been accompanied by major technological advances, as a result there has been a drastic increase of use of ICT applications when it comes to healthcare resulting in a dramatic increase in the use of ICT applications (*Ruxwana, et al. 2010*). This is also recognized by the use of the Public Internet Terminals (PITs) in the rural areas.

Through this research study, focus is on finding out how Public Internet Terminals (PITs) can be used to deliver basic health education to rural communities in South Africa. "A PIT is a stationary personal computer (PC) that is designed for public use with unique requirements of applications, software, hardware and connectivity for the users in a particular location" *(Karcher 2001, Cited in Coleman 2012).* The research will be conducted using different mediums including research articles, newspapers, Published Department of Communication (DoC) articles, South African Post Office (SAPO) published articles and Journals.

The South African government, through the Department of Communication (DoC), in partnership with the South Africa Post Office (SAPO), has rolled out 700 Public Internet Terminals (PIT) in many post offices in rural communities as part of the DoC's national projects .These PIT systems are available in many of the post offices in the rural communities with limited utilization by the rural community members (*Colmen, et al. 2008*).

This research proposal gives a detailed account of the research to be conducted.

2. Overview the research paradigm

A paradigm is a set of shared assumptions or ways of thinking about some aspects of the world (Oates 2012). Interpretivism approach has been identified as a research paradigm to be used for this study. This approach tries to find, discover and explain how factors in a particular social setting relate and depend on each other (Oates 2012). Interpretivism research looks at how people perceive their world and try to understand phenomena through the meaning and values that people assign to them. The aim of this research paradigm is to create a rich understanding of a possible unique context and an organized discovery of how human agents make sense of their perceived worlds and how those perceptions change over and differ from one person or group to another (Checkland and Holwell, 1988, cited in Oates 2012).

3. Literature Review

3.1 Overview of the Research topic

We cannot ignore the role ICT plays in the healthcare industry *(Clark 2007, cited in Ouma, Herselman 2008).* In this research study as in (*Colmen, Herselman, Jacobs 2008*), PIT is defined as a standalone Personal

Computer (PC), which is set up in a public place to provide information and Internet services for the users in the rural communities in South Africa. The PIT has a high transactional power and high information availability like a kiosk that allows citizens to pay taxes and access public information (*Colmen, et al. 2008*). With the public information that can be accessed through PIT, the information about basic health education is lacking, as a result rural communities end up with little or no information about their personal health. With focus of the current research on rural communities, the South Africa government, through the Department of Communication (DoC), in partnership with the South Africa Post Office (SAPO), has rolled out 700 Public Internet Terminals (PIT) in many post offices in rural communities as part of the DoC's national projects (DoC 2003, cited in *Colmen, et al. 2008*). The fundamental objective for the PIT is to create a communication infrastructure through which the public will have access to government information and services (*Colmen, et al. 2008*). The research is aimed in finding if the PIT can be used to deliver basic health education to rural communities in South Africa. As many countries, South Africa is faced with a challenge of technology not accessible by rural communities. "Gone are the days where patients only relied on the physicians about their health information, many people rely on the information acquired in the internet try and diagnose the sicknesses they have" *(Ouma, Herselman 2008)*. Physicians have to work hard to keep up the information that some of their patients know. By the time a person visits the Doctor they have already acquired some information on what might be the problem with their health is *(Ouma, Herselman 2008)*.

3.2 Concept Discussion

3.2.1 Concept Overview

The South African Department of Communication (DoC)'s mission statement states, "to strive towards a universal service to enable ordinary people to have access, not to traditional media, but also the convenience of Information Technology" (http://www.doc.gov.za/ [05/05, 2013]). The implementation on the PIT systems in the South African post offices has the aim to achieve this mission statement (*Colmen, et al. 2008*). Government and private sectors have invested amount of human and financial resources in the public libraries, telecenters, internet cafe and other forms without clear evidence of what the outcome will be *(Araba Sey, Michelle Fellows 2009)*. The government must itself become the user of the ICT *(Rajendra Prasad Poudel).* One of the challenges we face is that internet is still not considered as priority in some of the rural areas, but only roads and electricity are considered as priority *(Rajendra Prasad Poudel).*

3.2.2 Concept Matrix

Concept	**Description**	**Source**
e-Health	Term for healthcare practice supported by electronic processes and communication	Journal
ICT	Refers to technologies that provide access to information through telecommunications	Journal
Computer	Computer skills refer to one's ability to	Journal

Skills	utilize the software (and sometimes hardware) of a computer	
Language barrier	Barrier to communication resulting from speaking different languages	Journal
PIT	A stationary personal computer that is designed for public use with unique requirements of applications, software, hardware and connectivity for the users in a particular location	Journal
Information overload	It refers to the difficulty a person can have understanding an issue and making decisions that can be caused by the presence of too much information	Journal

Papers	e-Health	ICT	Computer Skills	Language Barrier	Information Overload	PIT
COLEMAN, A., 2012. Towards delivering e-health education using Public Internet Terminals (PIT) systems in rural communities in South Africa	X	X	X	X	X	X
OUMA, S., HERSELMAN, M.E. and VAN GREUNEN, D., 2009. Implementing successful e-health implementations within developing countries	X		X			
COLEMAN, A., HERSELMAN, M. and JACOBS, S., 2008. Factors influencing the utilization of the public Internet terminal system in two rural communities.		X	X	X	X	X
RUXWANA, N.L., HERSELMAN, M.E. and CONRADIE, D.P., 2010. ICT applications as e-health solutions in rural healthcare in the Eastern Cape Province of South Africa.	X	X				X
POUDEL, R.P., Access of ICT benefits for underserved rural communities in developing countries: A case study from Nepal.		X				

3.2.3 e-Health

The term e-health(electronic health) cannot be separated from ICT. E-health is used to access health information using the internet, therefore e-health can be seen as a combination of the ICT in the health sector *(Alfred Coleman, 2012).* According to (Dr Scott E Richard) e-health is broadly viewed as the use of information and communications technology to mediate health, health care, health education or health research. The Information systems for example, electronic health records(EHRs) and computers can be of great value in providing health care in multiple areas*(Blaya, Joaquin A; Fraser, Hamish SF; Holt, Brian, 2010)*. With e-health, people make use of the internet to be able to access their medical records, medical information, new discovered ways of treating patience, and this information is available to everyone anywhere in the world as long as they access to the internet. In this regard, clinics and hospitals end up depending on IT in order to run their day to day activities, in this regard, the ICT system must be put in place in order to assist in the daily running of things.

3.2.4 Benefits

(*Coleman, et al. 2008*) discusses what the rural communities could benefit from if they could take advantage of the PIT systems. Some of those benefits could be job searches, general government information, and poverty reduction by empowering the rural communities. Amongst all these benefits, the PIT system was also aimed in empowering the public to access information and communication via email (*Coleman, et al. 2008*). People are perishing because of the lack of knowledge or information. Some make uninformed decisions about something very important as their health, just because they were not well informed. The PIT system is implemented in order to bridge this gap between the poor in the rural areas and the rich in the cities. On the other hand patients have very little time with Physicians when they visit them for consultation, but people tend to rely on the information they get from the internet as it has unlimited information *(Alfred Coleman, 2012).* Patients also do not completely rely on the physician's information, they visit the internet to research on what they might be suffering from before they visit the physicians, this also posing a threat on the physicians that they must also keep researching to be on top of things *(Ouma, Herselman 2008).*

3.2.5 Factors affecting the use of the PIT

With the government having rolled out 700 PITs in the many post offices in the rural areas, it is still seen that the community is not making use of these systems to improve their lives (*Coleman, et al. 2008*). *(Araba Sey, Michelle Fellows 2009),* however shows that the public ICT model is not living up to the expectations placed on it. In the research conducted by *(Alfred Coleman, 2012),* in the two communities called Taung and Ganyesa in the Bophirima region of North West province in South Africa, it was found that the community was well accepting the PIT even though there were other factors that were making the community not to make use of these systems as fully as these systems are meant to be utilized. As we have many rural areas in South Africa and most of them have common or similar characteristics as the two selected communities of Taung and Ganyesa when it comes to their health needs and their population demographics. The implementation of the ICT systems has the biggest challenge of people not being able

to use them (*Ruxwana, et al. 2010*). The lack of computer skills is one of the factors that are preventing the people from these rural communities to be able to operate the PITs (*Coleman, et al. 2008*). This is also seen as the "Digital Divide" which is a term referred to the disparity between those who have access and can use ICT and those who cannot, this being the results of the lack of basic literacy skills *(T. Lavhengwa 2008).* This is the same even in young generations, since they are not exposed to the computer and internet world. Still there are many factors that play a role for these people to be so disadvantaged when it comes to technology. Access of information is vital because it empowers the poor communities' skills are enhanced *(Rajendra Prasad Poudel).*

Technology is actually taking over our lives. Regardless of this fact, there are people who are still fearful of the technology around us (*Coleman, et al. 2008*). As we might be aware that the rural communities are not exposed to the technologies, this brings fear to them when they are operating or making use of these technological systems and machines. The PIT system put in these areas, it's a new thing to the community members in these rural areas, and it brings fear when they are required to use these machines.

With few people amongst the many in the rural communities, there are others who can use the computers and the technology. These people on the other hand are faced with different challenges one of them being the information overload (*Coleman, et al. 2008, Alfred Coleman, 2012).* The PIT is perceived to be a system with loads of information that users end up confused on where to start. (*Coleman, 2012),* observed that people in the Taung and Ganyesa were confused by so many icons and they didn't know where to find the information they were actually looking for. This challenge and the rest of the challenges mentioned above can be overcome training the users of these ICT systems (*Ruxwana, et al. 2010*). When the members of these rural communities are involved in training, starting from computer training going to the actual system training, the results and the benefits of the PIT systems will be seen. The community will be able to use the PIT to access their basic health information and as a result they will be informed and as a result we'll have a much healthier population because people will be taking good care of their health.

As we know in South Africa we have 11 official languages and each of these languages dominating in their respective areas. (*Coleman, 2012)*'s research was done in the North West. The Setswana language is the most dominant language with 63.4% of the population speaking Setswana language (statssa 2011). The PIT uses English as the communication language. English is not the language that is mostly used in our rural communities in South Africa. This hinders the use of the PIT as most of the people do not understand the language (*Coleman, et al. 2008*). The community of Taung and Ganyesa would prefer if the system is in the Setswana language, since it is the language they understand well. As the results, the community members do not make use of the PIT because of the language barrier. The PIT must be in such a way that you can choose the language you would like to communicate in for example Setswana in the North West Province (*Coleman, 2012).*

In the implementation of the ICT systems, the local community must be involved in the process *(Ouma, Herselman 2008).* The rural communities are lacking awareness of the existence of the PIT, in that regard

they do not take ownership of the systems (*Coleman, et al. 2008*). Forms of publication can be used to make the public aware of the existence of the PITs and how they can change their lives. Local community meetings, local radio stations and the Chiefs involvement in these ICT systems can be the ways that can be used to communicate the existence of these systems (*Coleman, et al. 2008*). According to (*Coleman, 2012)*'s research, the communities in the rural areas has well accepted the PIT and it's perceived to be useful. However the community feels it is lacking some information, local information about their health like information on the vaccine, personal hygiene, nutrition and the pharmacies around them. With this kind of information, the community is able to take care of their health needs and be able to know steps and measures to take if they encounter themselves in this kind of diseases.

The PITs have reached their end of life and there has not been any maintenance on these PITs, some with hardware failure or software outdated *(P Matsena 2012).* With lack of ownership of the PIT, there has not been any maintenance on these systems. According to *(Ouma, Herselman 2008),* the ICT experts must be hired to maintain the system and the networks in the areas where the ICT systems are implemented. With the PITs not being looked after, lacking maintenance, the government is not seeing any benefit of implementing the PITs *(P Matsena 2012).*

The rural communities do not have good network signals and this as a result has an impact on the performance and response of the PIT system. Slow response was found to be one of the factors preventing the community members to use the PIT (*Coleman, 2012).* As the experts are hired to maintain the systems, they ought to be hired to maintain the networks as well *(Ouma, Herselman 2008).* The community members that are supposed to use the PIT end up being frustrated because of the slow response they are getting from the system, at the end they end up not completing the tasks they need to complete. Implementation costs are higher in the rural areas compared to the urban areas or the cities, also commercial viability and sustainability are major issues resulting in communities in this rural areas being left out in the access of ICT *(Rajendra Prasad Poudel).*

4. Research problem and research questions

The research questions will be formulated as follows:

4.1 What are the factors influencing the use of the PIT in the rural areas

This can be further broken down into sub questions as follows:

4.1.1 What are problems encountered when tasks are performed using the PIT

4.1.2 What are the factors preventing the rural communities members to use the PIT to access the government services and the basic health education

4.1.3 What are the benefits of the PIT in the rural communities

4.2 How can the PIT assist the illiterate computer users in the rural areas

5. Research strategy

Case study has been identified as the research strategy to be used for the current project. A case study studies the one instance, the use of the PIT system by the people in the rural areas to improve their health, the complex relationships with ICT and processes. This research strategy assists us to try and explain how and why certain outcomes similar to the user of PIT systems are occurring in a particular situation.

Case studies have an underlying philosophical paradigm of interpretevism where the aim is to create a rich understanding of a unique context of factors influencing the use of PIT system in the rural areas, how people make sense of their perceived worlds in the rural areas in South Africa. Case study is associated with interpretivism paradigm because the study of people is done in their natural social settings not in artificial world.

Case study as a research strategy uses a wide range of data sources, people as many as possible can be used to study the factors that are affecting the use of PIT and how can ICT be used to improve the lives of people in the rural areas. This approach is seen as more suitable for the current research project because it makes use of both quantitative and qualitative data, obtained via a large range of data generation methods.

Limitation of the current research study is internet and case study. These cannot be used as the people we are studying do not make use of the internet or have limited access to the internet. The ICT world changes every day, as a result the PIT system might not be the relevant technology for the government to be investing in, in the rural areas. At the end of the study, there might be other technologies that the government might need to look at to improve the health of people in the rural areas.

6. Data methods

6.1 Data Analysis Approach

For the purpose of this study, qualitative data analysis approach will be used. It is the main type of data generated by case studies, also being the main kind of data used and analyzed by interpretive researchers. Qualitative data incudes non-numeric data found on all the data methods. The research will also make use of quantitative analysis on the qualitative data generated. Qualitative analysis is suitable to the current research study because it does not study only that which can be reduced to numbers, but rather provide rich and detailed data and its analysis. Also with qualitative analysis, different but equally valid conclusions can be reached by different researchers.

6.2 Data Sources and Gathering

The research project will make use of the following data generation methods.

6.2.1 Questionnaire

A questionnaire is a pre-defined set of questions, assembled in a pre-determined order. This method is selected as questionnaires can be self-administered, meaning that the respondent can complete the questionnaire without the presence of the researcher. A questionnaire data generation method is suited for situations where we want to obtain data from a large number of people, obtain relatively brief and accepted information from people and we expect respondents to be able to read and understand the questions.

6.2.2 Interviews

An interview is a particular kind of conversation between people. The researcher will steer the discussion onto their topics of interest. A research interview is carried out openly in a meeting aiming to produce material for research purposes and the interviewee needs to agree to this. This data generation method is suitable for the current research project because it is aimed at obtaining detailed information on how the PIT system affects the lives of people living in the rural areas. We would also like to explore emotions, experiences or feelings that cannot be observed or described via pre-defined questionnaire responses.

6.2.3 Documents

A document is taken to mean any symbolic representation that can be recorded and retrieved for analysis. For the current research study we will make use of publications as a form of document-based data. Existing literature, journal articles and newspaper articles will be used as the form of data generation method. Our research project will make use of secondary data and research data archive. The use of secondary data for our research study will save us time, since we are going to reuse data that has already been collected, saving us time to generate the data ourselves.

6.3 Validity and Reliability

With regard to questionnaire as a data generation method, validity will be addressed in the following two ways, content and construct validity. Content validity, which makes sure well-balanced questions are used. The use of the literature, previously used will assist in addressing the content validity.

Construct validity, is concerned with whether the measure is measuring what we intend to measure. To address this validity, we may have to correlate responses against other responses in the questionnaire or other information.

Reliability is concerned with whether a questionnaire would yield the same results if given repeatedly to the same respondents. The approach that will be followed to address this issue would be the split-half method. With this method, the questions in the questionnaire are divided into two equivalent groups. The score of a respondent in one half is compared with the score in the other half. For the questionnaire to be reliable, the two scores should be the same

As our research project follows the qualitative research approach, we are going to address of issue of validity and reliability in several ways. To ensure validity of interviews, the technique called “member validation” will be used. In this technique, the respondent is given a copy of the interview to provide feedback. The issue of validity can also be addressed throughout the data collection and analysis processes. As more cases are

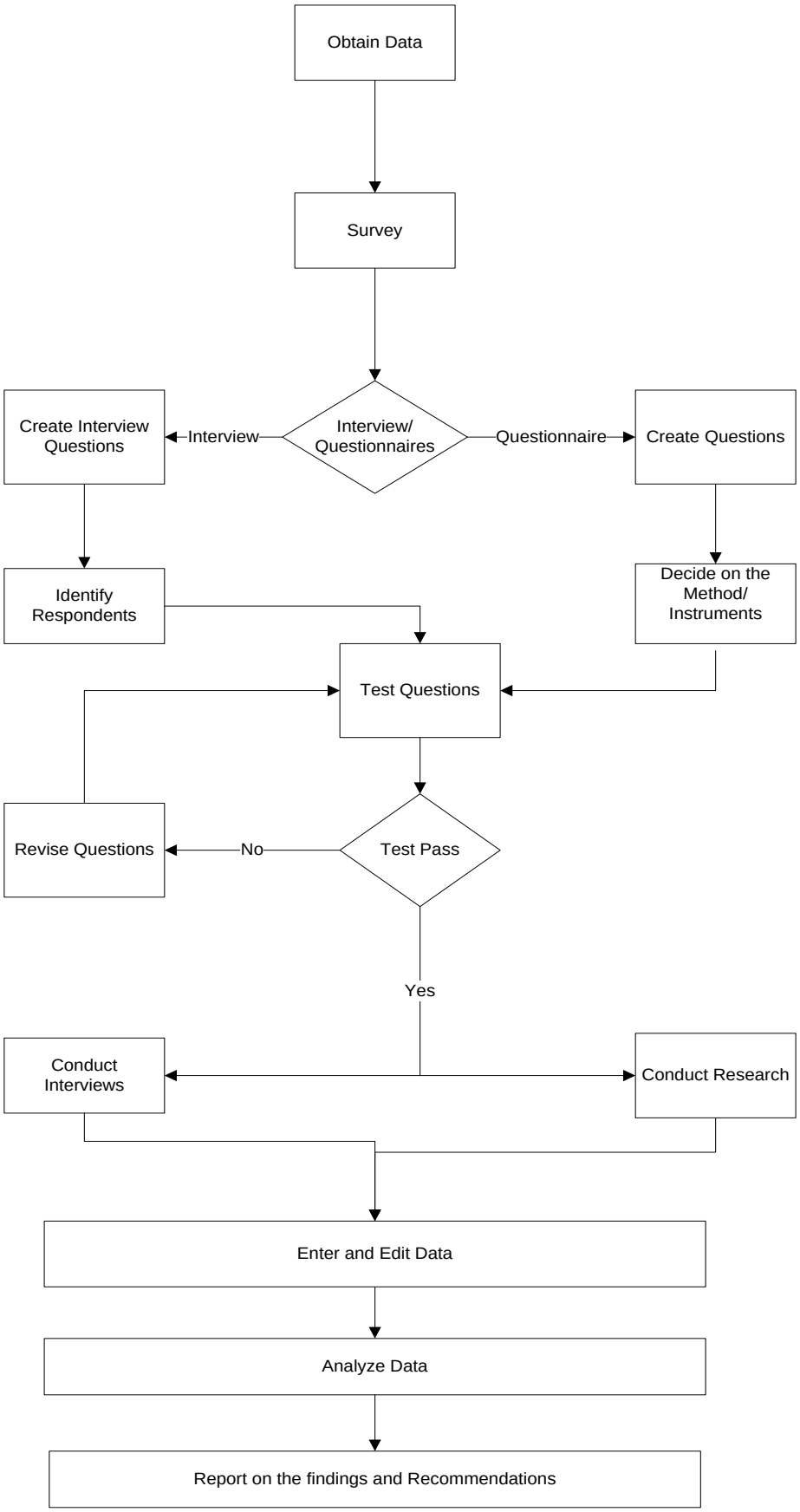
reviewed, common themes and patterns will be found and testing of emerging hypotheses, in these case we are working towards ensuring validity.

As the research is based on qualitative approach, issues of reliability and validity can also be addressed through triangulation, which is the use of different strategies to approach the same topic of investigation.

6.4 Ethical considerations

With analysis in qualitative research, there appear to be more ethical dilemmas and concerns with confidentiality. To respond to ethical issues the researcher might take a role of participant-as-observer, in which the identities of the researchers are known to the respondents.

7. Diagrammatic representation



Survey has been selected as a research strategy. We are going to make use of the Interview and Questionnaire as data source and gathering. Relevant questions will be created for both interview and questionnaires. For interviews, we are going to identify the respondents or people to be interviewed. In the case of questionnaires, we are going to decide on the method of delivering the questionnaires. Questions will be tested with family and friends before they can be used with the respondents. If required, revision of questions will be done and re-tested again. Once they pass they test, the actual process of data gathering will begin which will be conducting interviews or distributing questionnaires. Data will be entered in one place and edited if required. After this process is complete, the collected data will be analyzed and a report will be generated with the findings and recommendations.

8. Conclusion

The purpose of this research proposal is to give a detailed account of the research to be conducted. The need for the PITs is in the rural areas exists and people are accepting this ICT systems well. The literature shows that a need exist for the people in the rural areas where the PIT system has been implemented to be trained and people need to be hired to offer system training. The PIT system needs to be in a language that is used in these rural communities for the people to be able to use them. With the wide use of the e-health system, the PIT system can be incorporated with e-health, so that people can be even access their medical health information. An awareness campaign must be held in these rural areas where the community is being made aware of the PITs in their areas**.** The research proposal also details the approach to designing the research strategy. When these PITs are maintained regularly, problems like hardware failure and software being outdate will not be encountered, at the end the PITs will perform as required. The PIT system is a good initiative from the government and the DoC which if managed well and the people in the rural communities can take ownership of this ICT system, their lives can change in a massive way. The will be able to take care of their basic health, as a result, their health will not be neglected**.** The research paradigm that will be used to conduct the research, research strategies to be followed and the research methods are outlined. This research is based on interpretivism paradigm, making use of qualitative analysis approach as a data method. Issues of validity and reliability are also explained, ethical consideration that will be taken into account and a diagrammatic representation of the research design process

9. Terms and definitions

- PC (Personal Computer) - A computer built around a microprocessor for use by an individual, as in an office or at home or school
- PIT (Public Internet Terminal) - A stationary personal computer that is designed for public use with unique requirements of applications, software, hardware and connectivity for the users in a particular location.
- DoC (Department of Communication) – One of the departments of South African government, which is responsible for overseeing the South African communications, telecommunications and broadcasting industries
- ICT (Information and Communication Technology) - Refers to technologies that provide access to information through telecommunications.
- SAPO (South African Post Office) - Is the national postal service of South Africa and is owned by the South African government
- E-health (Electronic health system) - Is a relatively recent term for healthcare practice supported by electronic processes and communication

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